Supplement E: Managing International Travel-Related Transmission Risk

Summary of Changes in Version 2

This Supplement has undergone minor revisions in wording for consistency with the revised case definition for SARS-CoV disease.

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Managing International Travel-Related Transmission Risk

Goals

- Prevent the introduction of SARS-CoV (and spread from an introduction) into the United States from SARS-affected areas.
- Prevent exportation of SARS-CoV from the United States if domestic transmission presents an increased risk of exportation.
- Reduce the risk of SARS-CoV disease among outbound travelers to SARS-affected areas.
- Prevent the transmission of SARS-CoV to passengers on a conveyance with a SARS patient, and evaluate and monitor other passengers to detect SARS-like illness and prevent further spread.

Key concepts

- SARS-CoV can spread rapidly on a global scale through international travel if control measures are not implemented.
- SARS-CoV transmission usually involves close contact and is often limited to healthcare settings or households; the risk of SARS to travelers visiting an affected area is low unless travelers are exposed to these settings.
- Travelers visiting SARS-affected areas can reduce their risk by following recommended guidelines and can help prevent transmission by monitoring their health during and for 10 days after travel.
- SARS patients can transmit SARS-CoV to other passengers on conveyances and should postpone travel until they are no longer infectious.
- Active follow-up of passengers on conveyances with SARS cases can help prevent further spread by informing passengers of their exposure and providing instructions for monitoring health and seeking medical evaluation if symptoms develop.
- Transmission of SARS-CoV on conveyances can occur only if an undetected case boards. Therefore, the primary preventive strategy is to prevent symptomatic persons from traveling.

Priority activities

- Screen incoming travelers from SARS-affected areas for SARS, and provide guidance about monitoring their health and reporting illness.
- Provide guidance to outbound travelers about active SARS-affected areas and measures to reduce the risk of acquiring SARS-CoV disease during travel.
- If SARS-CoV transmission in the United States presents an increased risk of exporting SARS-CoV to other countries, then screen outbound travelers to prevent such exportation.
- Ensure the appropriate evaluation and management of SARS cases and potentially exposed passengers and crew members on conveyances.

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I. Rationale and Goals

The rapid global spread of SARS-CoV in 2003 was facilitated by international travel, as illustrated by the initial dissemination of the SARS outbreak from Hong Kong. Although travelers visiting SARS-affected areas are potentially at risk of contracting SARS-CoV disease, SARS-CoV transmission is generally localized and often limited to specific settings (e.g., hospitals) or households of SARS-CoV patients, even in settings with large outbreaks. Consequently, the overall of risk of SARS-CoV disease for outbound travelers who are not exposed to these settings is low. Nevertheless, nearly all U.S. laboratory-confirmed SARS cases were in travelers to SARS-affected areas. Screening and evaluating travelers for SARS-like symptoms, educating them about SARS, and reporting illness should therefore decrease the risk of travel-associated SARS. Because SARS-CoV can sometimes be transmitted on conveyances (e.g., airplanes), it is also important to prevent spread from an ill passenger with a SARS-like illness and to identify and monitor contacts on the conveyance for SARS-like illness.

Because of the significant impact of travel on the spread of communicable diseases such as SARS-CoV disease, legal authority exists at local, state, federal, and international levels to control the movement of persons with certain communicable diseases within and between jurisdictions. The types of measures that might be used to modify the risk of travel-related SARS-CoV disease range from distribution of health alert notices and arrival screening to quarantine of new arrivals and restrictions or prohibitions on nonessential travel. Although the states have authority for movement restrictions within states, federal laws govern movement between states and across international borders. Thus, airports and other ports of entry are sites of multiple overlapping jurisdictions where the interplay between various authorities must be clearly understood (See Section VII: Roles and Responsibilities, below).

The overall goals for the management of international travel-related SARS-CoV transmission risk are to:

- Prevent the introduction of SARS-CoV (and spread from an introduction) into the United States from SARS-affected areas.
- Prevent exportation of SARS-CoV from the United States if domestic transmission presents an increased risk of exportation.
- Reduce the risk of SARS among outbound travelers to SARS-affected areas.
- Prevent the spread of SARS-CoV to passengers on a conveyance with a SARS patient, and evaluate or monitor other passengers to detect SARS-like illness and prevent further spread.

II. Lessons Learned

During the 2003 global response, the control strategy for the United States included issuing travel alerts and advisories (see Box), distributing health alert notices to travelers arriving from areas with SARS, and conducting visual inspections of arriving travelers to facilitate early identification of imported cases and response to reports of ill passengers. CDC staff met more than 11,000 direct and indirect flights from SARS-affected areas and distributed more than 2.7 million health alert notices to arriving passengers as well as to persons arriving at 13 U.S. land border crossings near Toronto and departing passengers bound for the United States from the Toronto airport. Health alert notices informed returning travelers of potential exposure to SARS-CoV. They alerted travelers to the symptoms of SARS-CoV disease and advised them to promptly seek medical attention if symptoms develop. The notices also provided information and instructions for physicians.

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Travel Alerts and Travel Advisories

- Travel alerts and advisories are notifications of an outbreak of disease occurring in a geographic area. A ***travel alert***, a lower-level notice, provides information about the disease outbreak and informs travelers how to reduce their risk of acquiring the infection. An alert does not include a recommendation against nonessential travel to the area.
- When the health risk for travelers is thought to be high, a ***travel advisory*** recommending against nonessential travel to the area is issued. Travel advisories are intended to reduce the number of travelers to high-risk areas and the risk for spreading disease to other areas.
- CDC issues travel alerts and advisories based on evidence of transmission, spread of disease, and effectiveness of local prevention efforts. The quality of local disease surveillance and the accessibility of medical care are additional considerations.

During the outbreak response, CDC quarantine staff met planes reporting an ill passenger to facilitate 1) evaluation of the passenger for possible SARS-CoV disease, 2) collection of locating information on the other passengers, and 3) coordination with federal and local authorities. If the ill passenger was determined to be a possible SARS case, then the locating information was forwarded to state and local health departments for contact tracing.

Border and travel-related activities implemented in countries more seriously affected by SARS included pre-departure temperature and symptom screening, arrival screening (asking passengers about travel history and possible exposure to SARS-CoV), “stop lists” (maintaining lists of persons who were possible SARS cases or contacts to prevent them from traveling), and quarantine of travelers returning from other SARS-affected areas.

Lessons learned from this response support the recommendations included in this Supplement. These lessons included the following:

- SARS-CoV can spread rapidly on a global scale through international travel if control measures are not implemented.
- SARS-CoV transmission is usually localized and often limited to healthcare settings and households; the risk of SARS-CoV disease to travelers visiting an affected area is low unless travelers are exposed in these settings.
- Patients with SARS-CoV disease can transmit infection to other passengers on conveyances and should postpone travel until they are no longer infectious.
- SARS-CoV transmission can occur within the close confines of conveyances. Resulting infections usually represent a failure to recognize symptomatic index cases and their high-risk contacts, who should have been prevented from traveling.
- Active follow-up of passengers on conveyances with SARS cases can help prevent further spread by informing passengers of their exposure and providing instructions for monitoring their health and seeking medical evaluation if they become ill.

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III. Activities Directed to Inbound Travelers

The nature and scope of activities related to travelers entering or in the United States will differ depending on the extent of SARS-CoV transmission in the United States and in the country or countries from which the passenger has traveled (Appendix E1). When SARS-CoV transmission is absent or limited in the United States, then efforts will focus on promptly identifying cases imported from SARS-affected areas and preventing further spread from such cases. Guidelines have been developed for various groups who might be arriving from areas affected by SARS-CoV (www.cdc.gov/ncidod/sars/hostingarrivals.htm; www.cdc.gov/ncidod/sars/business_guidelines.htm). If active transmission of SARS-CoV is occurring in a U.S. city or area, then it will be important to prevent spread to other areas in the United States, possibly by limiting or restricting non-essential travel into or from the affected area.

Objective: Prevent spread from SARS-CoV-infected travelers entering the United States.

Basic Activities

- Inform incoming travelers about SARS, and provide guidance on monitoring their health and reporting illness to the appropriate authorities. This may be accomplished by use of:
  - Videos or public announcements on the conveyance just before arrival
  - Distribution of health alert notices before or upon arrival (www.cdc.gov/ncidod/sars/travel_alert.htm)
  - Posters or public announcements in airports
- Evaluate travelers who report SARS-like symptoms (e.g., fever or respiratory symptoms) during travel, and collect locating information for the other passengers and crew (See Section V: Activities Related to SARS on Conveyances).
- Respond to reports of ill passengers on airplanes or other conveyances arriving from areas with SARS-CoV disease.

Enhanced Activities

- If the level of transmission in another country is high, incoming passengers from that country might require enhanced screening and evaluation through:
  - Visual inspection of all travelers as they disembark
  - Screening of travelers for symptoms of SARS-CoV disease and recent high-risk exposures to SARS-CoV (e.g., SARS-CoV patients or high-risk settings) through a self-administered questionnaire
  - Temperature screening
- Quarantine inspectors at CDC quarantine stations and public health workers in locations near other ports of entry may be required to meet all airplanes or other conveyances arriving from areas with SARS to question crew members about any ill passengers and to visually inspect passengers upon disembarkation.
- If the level of SARS-CoV transmission in a U.S. area is sufficiently high to present a substantial risk to travelers, then non-essential travel to this area may be limited, cancelled, or subjected to increased surveillance measures.
- Other activities that may be considered but whose effectiveness is unclear (especially given the resources required for implementation) include:
  - Ten-day quarantine of all passengers arriving from SARS-affected areas
  - Collection of locating information on all arriving passengers

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IV. Activities Directed to Outbound Travelers

Activities related to outbound travelers will vary based on the extent of SARS-CoV transmission in the United States and at the destination (Appendix E1). If there is little SARS-CoV transmission in the United States, the goal is to inform travelers about the risk of SARS and appropriate measures to reduce the risk of acquiring SARS-CoV infection during travel (www.cdc.gov/ncidod/sars/travel_advice.htm). If there is extensive SARS-CoV transmission in the United States, then preventing the exportation of SARS-CoV will be an added objective.

Objective: Minimize outbound travelers' risk for exposure to SARS-CoV during travel or the risk of spreading SARS-CoV to other localities.

Basic Activities

- Issue travel alerts and advisories (see Box in Section II. Lessons Learned).
- Provide educational materials to travelers on measures to reduce the risk of SARS-CoV disease.

Enhanced Activities

- If there are locations with extensive SARS-CoV transmission where control measures do not appear to be effective, further travel restrictions (e.g., cancellation of flights) to those locations may be considered (see Section VII: Roles and Responsibilities).

- If the level of SARS-CoV transmission in the United States presents an increased risk for exportation, then some or all of the following might be implemented:
  - Pre-departure screening (e.g., temperature screening, visual screening) of outbound travelers
  - Health certifications, i.e., requiring travelers to have a medical examination before departure, with a doctor's statement that they are free of SARS-CoV symptoms and have not had close contact to a SARS-CoV patient in the past 10 days
  - Stop lists, i.e., maintaining lists of SARS cases and close contacts at ports of departure against which travelers' names can be checked to prevent them from traveling

V. Activities Related to SARS on Conveyances

A SARS patient on a conveyance presents a risk of transmission to other passengers and crew and to non-passengers on arrival and a risk of further spread from passengers who become infected. Many of the activities listed below are performed by CDC staff at the eight current quarantine stations and by public health workers in locations near other ports of entry with assistance by CDC quarantine station staff from that region.

Objective: Protect co-passengers and crew members from SARS-CoV-infected passengers and from transmission associated with passengers exposed to the index case.

Activities

Management of a potential SARS patient on a conveyance

- Separate the potential SARS patient as completely as possible from other passengers and the crew. The ill passenger should wear a surgical mask.

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- Ensure that persons caring for the ill passenger follow infection control measures recommended for cases of SARS (See Supplement I and www.cdc.gov/ncidod/sars/flight_crew_guidelines.htm).
- If possible, designate a separate toilet for the exclusive use of the ill passenger.
- Notify the airport or land port authorities at the destination so that health authorities are informed and prepared to meet the conveyance upon arrival, to manage the ill passenger, and to evaluate other passengers.

Management on arrival

- Separate the ill passenger from exposed, well co-passengers at the soonest moment both in transit and after arrival.
- Place the ill passenger in an isolation facility (if available), and assess.
- Assess other passengers for illness, types of exposures to the ill passenger, and other potential SARS-CoV exposures. EMS personnel and local emergency department staff can perform these evaluations using appropriate precautions (See Supplement I and www.cdc.gov/ncidod/sars/airpersonnel.htm).
- Transfer the ill passenger to a local healthcare facility for further evaluation if needed. Protocols and memoranda of agreement with ambulance services and hospitals with appropriate infection control measures in place should be established in advance (see Section VIII: Preparedness Planning.)

Management of passengers and crew on the same conveyance

- Collect locating information for all passengers and crew. This information should be obtained directly from passengers, if possible. If a potential SARS case on a conveyance is not detected until after arrival, this information can be obtained from passenger manifests, staff lists, and/or customs forms.
- Inform all passengers on board about SARS, and advise them to seek immediate medical attention if fever or respiratory symptoms develop within 10 days of the flight. Pay particular attention to close contacts of the case.
- Consider temporary detention of the plane and arrangements for monitoring and quarantine of all passengers and crew in some circumstances (e.g., if the ill passenger had contact with a laboratory-confirmed SARS case and had significant respiratory symptoms during a prolonged flight). Home quarantine may be used for persons who live in or near the port of arrival; a designated facility should be arranged for the others (See Supplement D).

VI. De-escalation of Control Measures

Objective 1: Downgrade or remove travel alerts and advisories as appropriate.

Activities

- CDC will downgrade a travel advisory to a travel alert when there is:
  - o Adequate and regularly updated reporting of surveillance data from the area
  - o No evidence of ongoing unlinked transmission for 20 days (two incubation periods) after the onset of symptoms for the last confirmed case without an epidemiologic link, as reported by public health authorities.
- CDC will remove a travel alert when there is:
  - o Adequate surveillance data from the area

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- o No evidence of new cases for 30 days (three incubation periods) after the date of onset of symptoms for the last case, as reported by public health authorities.
- o Limited or no recent instances of exported cases from the area. An *exported case* is an ill person who meets the definition for a probable or confirmed case of SARS-CoV disease and who acquired SARS-CoV infection in the area in question and then traveled outside the affected area to another region and was diagnosed there (i.e., the person was not identified as a part of contact tracing activities, and travel was not restricted).

Objective 2: Reduce measures used for inbound travelers as appropriate.

Activities

For all passengers arriving from areas with SARS-CoV transmission:

- Continue general education for passengers from a particular area until the travel alert has been lifted (30 days after the onset of symptoms for the last case in that area). Because travel patterns may make it difficult to determine passengers' points of origin, it may be more practical to continue general education until travel alerts have been lifted for all areas.
- Continue evaluating travelers who report symptoms of SARS during travel until the travel alert for that area has been lifted (30 days after the onset of symptoms for the last case from that area).

For passengers arriving from areas under a travel advisory:

- Continue the use of screening questionnaires until the area of origin is downgraded from a travel advisory to a travel alert.
- Continue meeting conveyances from SARS-affected areas and visually inspecting passengers until the area of origin is downgraded from a travel advisory to a travel alert.

Objective 3: Reduce other measures used for outbound travelers as appropriate.

Activities

- Continue pre-departure fever and symptom screening for passengers departing from areas with ongoing unlinked transmission, but consider discontinuing these activities 20 days after the onset of symptoms for the last unlinked case.
- Continue stop lists until there are no longer any cases under isolation or contacts under quarantine.

Objective 4: Reduce measures for management of passengers with SARS-CoV disease on conveyances as appropriate.

Activities

- Continue meeting any flight with an ill passenger on board who has SARS-like symptoms. If the passenger is seriously ill, evaluate and follow-up according to established protocols.
- Continue to collect locating information as long as the passenger has symptoms compatible with SARS-CoV disease and has traveled from an area with ongoing unlinked transmission (under a travel advisory). For areas that have been downgraded to a travel alert, locating information

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may not be needed unless the ill passenger meets the epidemiologic criteria for likely exposure to SARS-CoV (See Supplement B, Appendix B1).

- The need for monitoring and quarantine of contacts of a passenger from an area on travel alert should be determined after the ill passenger has been fully evaluated.

VII. Roles and Responsibilities

Because jurisdictions and authorities at airports and other ports of entry overlap, it is important that local, state, and federal staff establish protocols and outline roles and responsibilities in advance of a public health emergency.

Currently, eight of the international airports have permanent federal quarantine staff (www.cdc.gov/ncidod/dq/quarantine_stations.htm). These federal quarantine staff have primary responsibility for handling the quarantine-related travel activities described above. State and local public health staff may provide assistance. At other airports and ports, local and state public health staff or other deployed persons will have primary responsibility, under the coordination of regional quarantine personnel. The local health jurisdiction will have primary responsibility for follow-up and management of passengers who may have been exposed to a SARS case on a conveyance.

Most local and state jurisdictions have adequate quarantine authority to require a person with a possible communicable disease, such as SARS-CoV disease, or their contacts to be detained for evaluation. Federal authority can be used if necessary. Public health officials should work closely with local, state, and federal law enforcement officials to enforce quarantine authority for persons who do not cooperate voluntarily.

VIII. Preparedness Planning

A. Legal authority for restricting movement

In advance of the possible reappearance of SARS-CoV, public health officials should:

- Work closely with their legal counterparts to ensure that the legal authority for movement restrictions at the local, state, and federal levels is known and understood and to establish boundaries of authority and processes to address multi-jurisdictional issues (See Supplement A).
- Develop plans for making decisions on movement restrictions, such as: 1) requirements for pre-departure screening, 2) requirements for arrival screening and/or quarantine, 3) travel prohibitions on cases and contacts, 4) restrictions related to use of mass transit systems, and 5) cancellation of non-essential travel.
- Work closely with local, state, and federal law enforcement to develop plans for enforcement of these restrictions.

B. Engagement of key partners

In advance of the possible reappearance of SARS-CoV, public health officials should:

- Begin preparedness planning by identifying key partners representing: 1) law enforcement (local, state, federal), 2) legal community, 3) emergency medical services (for evaluation of ill arriving passengers and transportation to the hospital), 4) hospital personnel, 5) transportation industry personnel, and 6) other emergency management personnel. The partners should be involved in the planning process.

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- Develop plans for the training, mobilization, and deployment of pertinent public health and other staff.
- Conduct training programs and drills.
- Provide respirator fit-testing and training in use of PPE for persons at risk for exposure to possible SARS cases.
- Plan for the diversion of conveyances carrying supplies for maintenance of critical infrastructure around key transportation hubs that may be affected by SARS-CoV.

C. Protocols for management of ill arriving passengers

Public health officials and CDC quarantine staff, in collaboration with legal and law enforcement authorities, should develop protocols for the management of ill arriving passengers at ports of entry, including provisions for:

- Meeting flights with a reported ill passenger
- Establishing notification procedures and communications links
- Separating the ill passenger during assessment
- Assessing the ill passenger and referring for evaluation and care
- Transporting the ill passenger to a designated healthcare facility (see Supplement D.)
- Collecting locating information on other passengers and crew
- Collecting the flight manifest, customs declarations, and other information for contact tracing
- Identifying any other ill passengers and separating them from well passengers
- Quarantining contacts if necessary, including transportation to a quarantine facility
- Providing enforcement for uncooperative ill passengers or contacts

See Supplement A.

D. Memoranda of agreement (MOA) with healthcare facilities, transport services, emergency medical systems, and physicians

- State and local public health officials should work with federal quarantine staff to develop MOAs with hospitals near ports of entry; these facilities must be equipped to isolate, evaluate, and manage possible SARS patients (see Supplement C).
- Agreements should include arrangements with a designated emergency medical service for on-site assessment of ill passengers and transportation to a hospital for evaluation.

See Supplement A.

E. Designation of quarantine facility

State and local public health officials should identify a facility for travelers who are designated as contacts and who require quarantine but cannot be quarantined at home.

F. Roles and responsibilities

Roles and responsibilities should be outlined for the various partners and the various levels of jurisdiction (local, state, and federal) for each component of the response.

For additional information and material on prevention of SARS travel-related risks, see www.cdc.gov/ncidod/sars/travel.htm.

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Appendix E1
Travel-Related SARS Response Matrices

Matrix 1: Suggested Activities for Inbound Travelers

Level of SARS-CoV transmission activity in the United States	Suggested actions, by situation in originating location
No known SARS-CoV transmission worldwide **or** known SARS-CoV activity but only imported cases	***Imported cases; limited transmission in location of origin*** • Distribute health alert notices to all arrivals. • Implement passive monitoring of all arriving passengers for development of fever or respiratory symptoms. • Advise persons who develop symptoms to self-report before presentation to healthcare provider. • Follow quarantine officer protocol for arriving ill passengers o Follow procedures for ill contacts o Collect 30-day contact information for passengers on conveyances with ill passenger • Consider enhanced surveillance for ill passengers. ***Extensive transmission / effective control measures*** • Implement active surveillance for ill passengers. • Implement symptom screening for all arriving passengers. • Medically evaluate all passengers with symptoms. • Consider 10-day quarantine for asymptomatic arrivals. • Collect contact information on all arriving passengers. ***Extensive transmission / ineffective control measures*** • Prohibit all non-essential arrivals. • Conduct medical screening upon arrival. • Implement mandatory 10-day quarantine for all asymptomatic arrivals. • Collect contact information on all arriving passengers.
Extensive SARS-CoV transmission in United States and community, with effective control measures	***Imported cases; limited transmission in location of origin*** • Minimize non-essential travel. • Consider restricting travel within jurisdictions. • Advise arrivals to follow procedures based on situation in location of origin. ***Extensive transmission / effective control measures*** • Minimize non-essential travel. • Consider restricting travel within jurisdictions. • Advise arrivals to follow procedures based on situation in location of origin. ***Extensive transmission / ineffective control measures*** • Prohibit all non-essential arrivals. • Conduct medical screening upon arrival. • Implement mandatory 10-day quarantine for all asymptomatic arrivals. • Collect contact information on all arriving passengers.

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Extensive SARS-CoV transmission in United States and community, with ineffective control measures	***Imported cases; limited transmission in location of origin*** • Prohibit all non-essential arrivals. • Advise arrivals to follow procedures based on situation in location of origin. ***Extensive transmission / effective control measures*** • Prohibit all non-essential arrivals. • Advise arrivals to follow procedures based on situation in location of origin. ***Extensive transmission / ineffective control measures*** • Prohibit all non-essential arrivals. • Conduct medical screening upon arrival. • Implement mandatory 10-day quarantine for all asymptomatic persons. • Collect contact information on all arriving passengers.

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Matrix 2: Suggested Activities for Outbound Travelers

Level of SARS-CoV transmission	Suggested actions
No known SARS-CoV transmission worldwide	• No special activities
SARS activity in United States and community, but only imported cases	• Issue travel alerts for countries with limited transmission. • Issue travel advisories for countries with extensive transmission. • Prohibit non-essential travel to countries where control measures are inadequate. • Consider: o Medical screening at all exit points o Travel prohibition for all persons meeting case definition with epidemiologic link to transmission setting o Medical assessment for all with signs/symptoms without epidemiologic link • Prohibit travel for persons under quarantine.
Extensive SARS-CoV transmission in United States and community, with effective control measures	• Issue international travel alerts/advisories/prohibitions as above. • Issue alerts/advisories/prohibitions for domestic destinations based on setting and transmission pattern. • Initiate medical screening of departing passengers at all exit points. • Prohibit travel for all persons meeting case definition. • Prohibit travel for all persons under quarantine. • Require health certificate for exit.
Extensive SARS-CoV transmission in United States and community, with ineffective control measures	• Issue international travel alerts/advisories/prohibitions as above. • Issue domestic alerts/advisories/prohibitions as above. • Prohibit nonessential outbound travel. • Require health certificate for essential travel. • Implement medical screening at all exit points. • Prohibit travel for all persons meeting case definition. • Prohibit travel for all persons under quarantine.